REMARKS

Claims 1-32, 34-87 and 89-112 are pending in the present application.

Claims 1, 2, 4-11, 13, 14, 16-19, 21-28, 30, 32-36, 40-46, 56, 57, 59-66, 68, 69, 71-74, 76-83, 85, 87-91, 95-101, 111 and 112 are rejected under 35 U.S.C. 102(e) as being anticipated by Carson (U.S. Patent No. 6,477,124). Claims 3, 29, 58 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson. Claims 12, 15, 20, 47, 67, 70, 75 and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Kamoto, *et al.* (U.S. Patent No. 5,708,649 - hereinafter "Kamoto"). Claims 31 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Watanabe, *et al.* (U.S. Patent No. 6,775,227 - hereinafter "Watanabe"). Claims 37-39 and 92-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Dubois, *et al.* (U.S. Publication No. 2002/0142248). Claims 48-55 and 103-110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Imai, *et al.* (U.S. Patent No. 5,799,145 - hereinafter "Imai"). Reconsideration and removal of the rejections are respectfully requested.

The present invention as claimed in independent claim 1 is directed to a method for authenticating a digital medium. A read operation of data symbols from a media reading device is requested at a computing device. A transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, is monitored. The read user data is in a format that can be processed by the computing device. The transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation. The presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium is determined, at the computing device, from the monitored transfer rate, by identifying a modification in the

transfer rate of the read user data from the media reading device to the computing device. The digital medium is authenticated based on a characteristic of the anomaly region.

The present invention as claimed in independent claim 56 is directed to a system for authenticating a digital medium. A computing device requests a read operation of data symbols from a media reading device. A monitor monitors a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium. The read user data is in a format that can be processed by the computing device. The transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation. The computing device further includes an anomaly detector that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device. An authenticator authenticates the digital medium based on a characteristic of the anomaly region.

With regard to section 6 of the Office Action, the Office Action refers to "figures 4 and 5" of Carson "as clearly show[ing] changes in data rate at a constant linear velocity." (The Applicants assume that the intention was to recite "figures 4 and 6" of Carson in connection with this statement, and not "figures 4 and 5".) While the Applicants agree that Figures 4 and 6 of Carson illustrate changes in data rate at a constant linear velocity, the Applicants note that Figures 4 and 6 are graphical representations of a data rate profile indicative of the frequency at which data are written to the optical disc by the system, and not the frequency at which data are read from the disc by the system. The Applicants further acknowledge that Carson discloses, at column 9, lines 30-39, that the readback system 140 of Carson reads data from selected locations, i.e., the disruption zones, while characterizing the associated data, and further that one method of

characterization may comprise measurement of a "data readback frequency" for a given disc velocity. However, the Applicants note that the use of the terms "data rate" and "data readback frequency" by Carson have meanings that are carefully defined in the Carson disclosure at column 2, lines 40-48, as follows:

> The disc is provided with a data placement zone to which first data are written to produce a first data rate as a frequency at which the first data pass the readback head assembly as the disc is rotated at a selected linear velocity. The disc further includes a velocity disruption zone adjacent the data placement zone to which second data are written to produce a second data rate as a frequency at which the second data pass the readback head assembly as the disc is rotated at the selected linear velocity. (emphasis added)

It is clear that Carson carefully defines "data rate" as meaning the rate at which the first data of the data placement zones or the second data of the velocity disruption zones are presented to the read head. The first data and second data referred to in this statement clearly take the form of data symbols, that is data symbols as written on the disc in the form of a series of pits and lands. Thus, the term "data rate", or related terms such as "data readback frequency", referred to throughout the specification and drawings of Carson are clearly meant to describe the lengths of the pits and lands within the data symbols, which have a direct relation to the rate, or frequency, at which they are presented to the read head 144 during a reading operation.

Carson presents two scenarios under which characterization of the written data can take place at column 9, lines 30-39.

> At step 276, the readback system 140 proceeds to move the readback assembly 144 to one or more selected locations on the disc 142, and read the data from these locations while characterizing the associated data rate. Such characterization will depend on the format of the data rate profile information stored in step 262 of FIG. 8, but may comprise measurement of linear or rotational velocity of

> the disc for a given data rate, or measurement of a data readback frequency for a given disc velocity.

In a first scenario, which is described in Carson at column 9, lines 36-38, measurement of the linear disc velocity that is necessary to maintain a constant "data rate" is performed, as shown in figures 5 and 7 of Carson. In a second scenario, which is briefly mentioned in Carson at column 9, lines 38-39, measurement of the rate at which the data symbols, in the form of a series of pits and lands, are presented to the read head while maintaining a constant disc linear velocity is performed. Measurement under the second scenario during a read operation can result in characterization data that appears similar to the data shown in Figures 4 and 6 of Carson. This data is representative of the measured "data rate", i.e., the rate at which the data symbols are presented to the read head 144, assuming a constant linear velocity for the nominal zones 176, 178, 180 and 182 and the disruption zones 184, 186 and 188 of the disc. In Carson, this "data rate" and/or related "disc linear velocity" are measured and used to prevent unauthorized duplication. In contrast, in the present invention as claimed in claims 1 and 56, authentication of the digital medium includes monitoring a "transfer rate" of read user data from an output of the media reading device to the computing device, rather than a "data rate" between the disc 142 and the read head 144 as disclosed in Carson.

With regard to section 7 of the Office Action, the Office Action states that Figure 9 of Carson illustrates a read back operation of data from the disc and that the read back signal is decoded, and thus the Carson reference provides a showing that the data is monitored in a format that can be processed by the computing device. The Applicants acknowledge that the Carson readback system 140 results in the generation of processed, decoded data, for example OUTPUT DATA 158 of FIG. 3. However, the Applicants further note that the OUTPUT DATA 158 is not what is being measured in Carson to characterize the Carson "data rate." Rather, Carson specifically discloses that the characterization of the "data rate" is based on measuring the rate at which data in the form of a series of pits and lands are presented to the read head 144. Therefore, in Carson the "data rate" being monitored is the rate at which the data symbols in the form of pits

and lands are presented to the read head; such data symbols are not the processed, decoded OUTPUT DATA 158. While the read data symbols in Carson may eventually become processed, decoded OUTPUT DATA 158, the processed, decoded OUTPUT DATA 158 of Carson is not what is being measured to determine whether a velocity disruption zone is present to authenticate the medium.

In the present invention as claimed in claims 1 and 56, the presence of an anomaly region is determined based on a monitored "transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium." A synopsis of the present invention as claimed in claims 1 and 56 was provided in Applicants' Amendment A, filed in the present application on March 7, 2006, and is repeated below for the convenience of the Examiner:

> In the present invention as claimed in claims 1 and 56, the "transfer rate" of read data that is monitored is the rate at which data are transferred from the media device to the computing device resulting from the requested read operation. An example of this feature is provided in the specification as filed at least at FIG. 10 and the corresponding discussion at page 27, line 7 - page 29, line 23. In this example, computing device 73 requests a read operation of data from a media device 72 including a medium 74. In response to the read request, a data stream 78 is returned to the computing device 73. The transfer rate of the returned data stream 78 is monitored at transfer rate analysis unit 82. The computing device 73 determines, from the monitored transfer rate, whether anomaly region 75 is present on the medium 74. For example, the behavior of the transfer rate over time, as shown in the example of FIG. 3 of the present specification, can be monitored and analyzed, and a decision as to the presence of an anomaly region 75 can be made by the computing device 73 based on modifications to the transfer rate. An authentication of the digital medium 74 can then be performed 83 based on a characteristic of the anomaly region.

While the Applicants agree that the pits and lands, i.e., data symbols, in Carson are indeed representations of data, when Carson refers to measuring "data readback frequency," Carson is clearly referring to the rate at which the data symbols on the disk 142 in the form of pits and

lands are presented to the read head 144. Carson does not make reference to the "transfer rate" at which the processed, decoded data, namely OUTPUT DATA 158, are transferred from the Carson readback system 140 to the host system of Carson (not shown in the Carson drawings); nor does Carson make use of such a "transfer rate" in characterizing the data, or in authenticating the medium on which the data reside. Carson discloses the eventual decoding of the data symbols and transferring of the decoded data OUTPUT DATA 158 to the host system (see Carson, column 6, lines 12-27); however, this decoded data OUTPUT DATA 158 that is transferred to the host system is not being monitored to determine whether a disruption zone has been encountered. Therefore, it is submitted that Carson does not teach or suggest monitoring of the transfer rate of the OUTPUT DATA 158 of the readback system 140 to the host system.

In consideration of the above, Carson fails to teach or suggest the present invention as claimed in independent claims 1 and 56. In particular, Carson fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", as claimed in claim 1. Carson further fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", as claimed in claim 56.

Carson does not teach or suggest the monitoring of (claim 1) or a monitor that monitors (claim 56) "a transfer rate of read user data ..." the read user data being "in a format that can be processed by the computing device." Carson instead teaches the monitoring of what is referred to in Carson as a "data rate" of the data symbols recorded on the disc; namely, monitoring the rate at which pits and lands are presented to the read head during a readback operation, which, in Carson, amounts to the relative lengths of the pits and lands as recorded on the disk. The data symbols, i.e., a series of pits and lands, in Carson are not "read user data" that are "in a format that can be processed by the computing device...", as claimed in claims 1 and 56. Instead, the Carson data symbols that are monitored are pre-processed structures, pits and lands, on the disk that are not yet converted to such a format. While Carson discloses decoding the data symbols and transferring the decoded data OUTPUT DATA 158 to the host system, this decoded data OUTPUT DATA 158 as transferred to the host system is not being monitored by Carson for authentication purposes.

In addition, Carson does not teach or suggest the monitoring of (claim 1) or a monitor that monitors (claim 56) "a transfer rate of read user data from an output of the media reading device...", as claimed. Carson does not teach or suggest monitoring of the rate at which the data output from the readback system 140, namely output data OUTPUT DATA 158, are transferred. Carson instead teaches monitoring the "data rate" at which pits and lands are presented to the read head on the disk 142, as described above, which monitoring is made in connection with the internal operation of the readback system 140. As explained above, the monitored "data rate" of the "data symbols" in Carson is different than the rate of transfer of the Carson output data OUTPUT DATA 158.

Further, Carson fails to teach or suggest "determining, at the computing device ..." (claim 1) or "an anomaly detector at the computing device that determines ..." (claim 56), from the "monitored transfer rate, the presence of an anomaly region on the digital medium ... by identifying a modification in the transfer rate of the read user data." Carson does not discuss

monitoring of the transfer rate of the output data OUTPUT DATA 156 output by the readback system 140. Carson instead monitors the rate at which data symbols, i.e., pits and lands, are presented to the read head. Further, what is monitored in Carson, namely variations in the data rate of the pits and lands on the disk, is not "read user data" in a format that can be processed by a computing device, as claimed in claims 1 and 56, as described above.

Independent claims 1 and 56 are therefore believed to be in condition for allowance, and such allowance is respectfully requested. With regard to the rejection of dependent claims 2, 3, 4-11, 13, 14, 16-19, 21-28, 29, 30, 32-36, 40-46, 57-66, 68, 69, 71-74, 76-83, 84, 85, 87-91, 95-101, 111 and 112, it is submitted that these claims should inherit the allowability of independent claims 1 and 56 from which they depend.

With regard to the rejection of claims 12, 15, 20, 47, 67, 70, 75, and 102 in view of the combination of Carson and Kamoto, Kamoto is cited in the Office Action as disclosing that the absolute address represents an encoded data value. Kamoto discloses a disk storage medium having a plurality of data areas. The data in each of the data areas are stored at respectively different clock rates, and all of the address data in all of the address areas are stored at the same constant clock rate. Kamoto in no way teaches or suggests monitoring a transfer rate of data in order to detect an anomaly region.

Therefore, it is submitted that, like Carson, Kamoto fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an

anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Kamoto fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device", as claimed in claim 56. Kamoto in no way teaches or suggests monitoring a transfer rate of data.

Since neither Carson nor Kamoto teach or suggest the stated limitations, there is no combination of the references that would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claims 12, 15, 20, and 47, as may be applied to independent claim 1, and reconsideration and removal of the rejection of claims 67, 70, 75, and 102, as may be applied to independent claim 56, and allowance of such claims, are respectfully requested.

With regard to the rejection of claims 31 and 86 in view of the combination of Carson and Watanabe, Watanabe is cited in the Office Action s teaching the steps of performing the authentication reside in firmware that is stored in a media drive performing the authentication or in a computing device controlling the media drive, or stored remotely and provided to the media drive by a network connection. Watanabe discloses determining the authenticity of a disc by

creating a feature forming area on a disc in which pit arrays are formed between recording tracks and pitless areas on the inner and outer periphery sides thereof. When the feature forming area is read a plurality of times, the data will be randomly read. The authenticity of a disc is determined based on the probability of previously-read data being different form currently-read data as a result of reading the feature forming area.

Therefore, it is submitted that, like Carson, Watanabe fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Watanabe fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device", as claimed in claim 56.

Instead, in Watanabe, he authenticity of a disc is determined based on the probability of previously-read data being different form currently-read data as a result of reading the feature forming area. Watanabe in no way teaches or suggests monitoring the transfer rate of read user data.

Since neither Carson nor Watanabe teach or suggest the stated limitations, there is no combination of the references that would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claim 31, as may be applied to independent claim 1, and reconsideration and removal of the rejection of claim 86, as may be applied to independent claim 56, and allowance of such claims, are respectfully requested.

With regard to the rejection of claims 37-39 and 92-94 in view of the combination of Carson and Dubois, Dubois is cited in the Office Action as disclosing the modification in transfer rate comprises a reduction in the transfer rate to a resultant zero transfer rate. Dubois discloses an optically readable data medium including a photosensitive portion. The photosensitive portion has an A state in which it is transparent. When the photosensitive portion is subjected to UV radiation, the photosensitive portion switches to the state B in which it is a blue color. The disc is authenticated by verifying that at least some of the disk data is initially unreadable and that it subsequently becomes readable after being exposed for a predetermined length of time to the read laser beam 9. Dubois in no way teaches or suggests monitoring a transfer rate of data in order to detect an anomaly region.

Therefore, it is submitted that, like Carson, Dubois fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading

device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Dubois fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media reading device to the computing device", as claimed in claim 56. Instead, in Dubois the disc is authenticated by verifying that at least some of the disk data is initially unreadable and that it subsequently becomes readable after being exposed for a predetermined length of time to the read laser beam 9. Dubois in no way teaches or suggests monitoring the transfer rate of read user data.

Since neither Carson nor Dubois teach or suggest the stated limitations, there is no combination of the references that would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claims 37-39, as may be applied to independent claim 1, and reconsideration and removal of the rejection of claims 92-94, as may be applied to independent claim 56, and allowance of such claims, are respectfully requested.

With regard to the rejection of claims 48-55 and 103-110 in view of the combination of Carson and Imai, Imai is cited in the Office Action as disclosing monitoring comprises recording prior settings of the reading device prior to reading and restoring the prior settings of the reading device following authenticating. Imai discloses using passwords to access data. Imai in no way teaches or suggests in no way teaches or suggests monitoring the transfer rate of read user data.

Therefore, it is submitted that, like Carson, Imai fails to teach or suggest "monitoring a transfer rate of read user data from an output of the media reading device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "determining, at the computing device, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read data from the media device to the computing device", as claimed in claim 1. It is further submitted that like Carson, Imai fails to teach or suggest "a monitor that monitors a transfer rate of read user data from an output of the media device to the computing device resulting from the reading of data symbols stored on a digital medium installed on the media reading device at a physical location of the digital medium, wherein the read user data is in a format that can be processed by the computing device and wherein the transfer rate is a rate, in data elements per unit time, at which read user data elements are returned from the media reading device to the computing device in response to the requesting of the read operation", and "an anomaly detector at the computing device that determines, from the monitored transfer rate, the presence of an anomaly region on the digital medium corresponding to the physical location of the data symbols on the digital medium by identifying a modification in the transfer rate of the read user data from the media

reading device to the computing device", as claimed in claim 56. Imai in no way teaches or suggests monitoring the transfer rate of read user data.

Since neither Carson nor Imai teach or suggest the stated limitations, there is no combination of the references that would teach or suggest the stated limitations. Accordingly, reconsideration and removal of the rejection of claims 48-55, as may be applied to independent claim 1, and reconsideration and removal of the rejection of claims 103-110, as may be applied to independent claim 56, and allowance of such claims, are respectfully requested.

Closing Remarks

It is submitted that all pending claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Respectfully submitted,

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